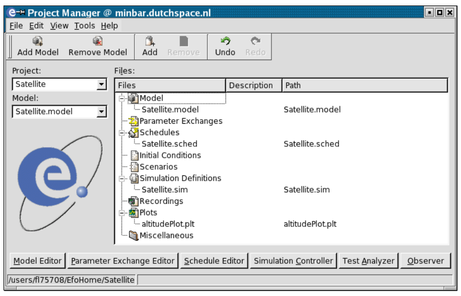
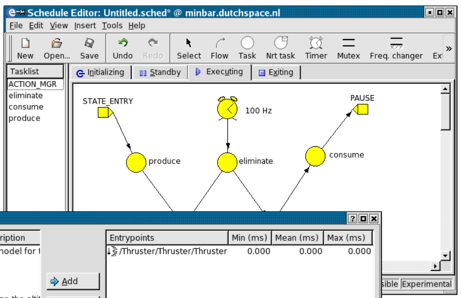
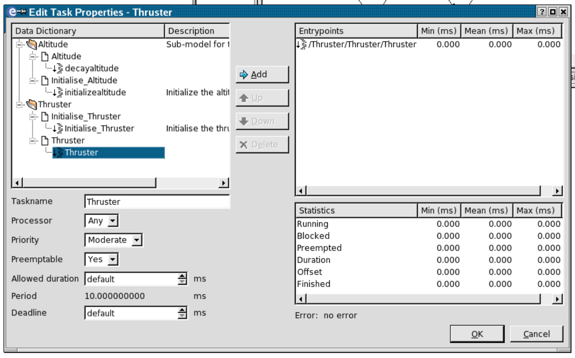
eurosim

EuroSim Mk4.0
Owner's Manual


Project Manager @ minbar.dutchspace.nl
File Edit View Tools Help
Add Model Remove Model Add Remove Undo Redo
Project:
Satellite
Model:
Satellite.model
Files:
Files Description Path
Model
Satellite.model Satellite.model
Parameter Exchanges
Schedules
Satellite.sched Satellite.sched
Initial Conditions
Scenarios
Simulation Definitions
Satellite.sim Satellite.sim
Recordings
Plots
altitudePlot.plt altitudePlot.plt
Miscellaneous
Model Editor Parameter Exchange Editor Schedule Editor Simulation Controller Test Analyzer Observer
/users/fl75708/EfoHome/Satellite

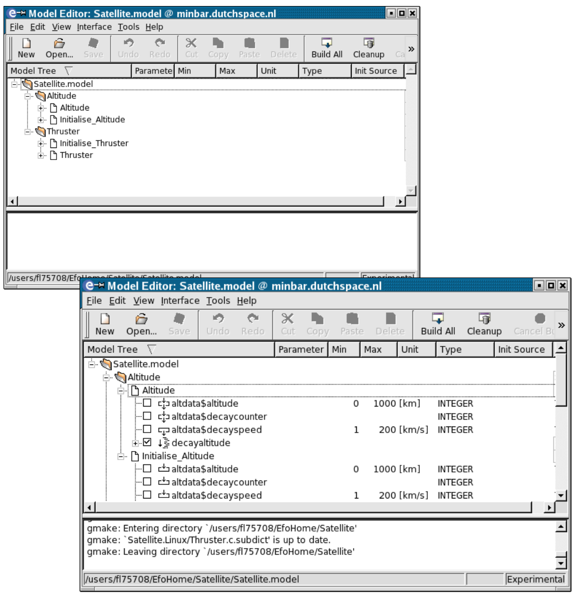

Schedule Editor: Untitled.sched* @ minbar.dutchspace.nl
File Edit View Insert Tools Help
New Open... Save Undo Redo Select Flow Task Nrt task Timer Mutex Freq. changer
Tasklist
ACTION_MGR
eliminate
consume
produce
Initializing Standby Executing Exiting
STATE_ENTRY
100 Hz
PAUSE
produce
eliminate
consume


Edit Task Properties - Thruster
Data Dictionary Description
Altitude Sub-model for t
Altitude
decayaltitude
Initialise_Altitude
initializealtitude Initialize the alti
Thruster
Initialise_Thruster
Initialise_Thruster Initialise the thru
Thruster
Thruster
Add Up Down Delete
Entrypoints Min (ms) Mean (ms) Max (ms)
/Thruster/Thruster/Thruster 0.000 0.000 0.000

Taskname Thruster
Processor Any
Priority Moderate
Preemptable Yes
Allowed duration default ms
Period 10.000000000 ms
Deadline default ms

Statistics	Min (ms)	Mean (ms)	Max (ms)
Running	0.000	0.000	0.000
Blocked	0.000	0.000	0.000
Preempted	0.000	0.000	0.000
Duration	0.000	0.000	0.000
Offset	0.000	0.000	0.000
Finished	0.000	0.000	0.000

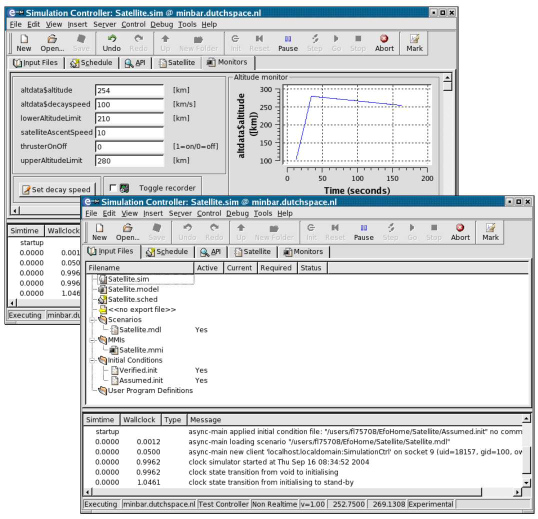
Error: no error


Model Editor: Satellite.model @ minbar.dutchspace.nl
File Edit View Interface Tools Help
New Open... Save Undo Redo Cut Copy Paste Delete Build All Cleanup
Model Tree Parameter Min Max Unit Type Init Source
Satellite.model
Altitude
Altitude
Initialise_Altitude
Thruster
Initialise_Thruster
Thruster

Model Tree	Parameter	Min	Max	Unit	Type
altdata$altitude		0	1000	[km]	INTEGER
altdata$decaycounter					INTEGER
altdata$decayspeed		1	200	[km/s]	INTEGER
decayaltitude					
Initialise_Altitude					
altdata$altitude		0	1000	[km]	INTEGER
altdata$decaycounter					INTEGER
altdata$decayspeed		1	200	[km/s]	INTEGER

```
gmake: Entering directory `/users/fl75708/EfoHome/Satellite'
gmake: `Satellite.Linux/Thruster.c.subdict' is up to date.
gmake: Leaving directory `/users/fl75708/EfoHome/Satellite'
```

/users/fl75708/EfoHome/Satellite/Satellite.model Experimental


Simulation Controller: Satellite.sim @ minbar.dutchspace.nl
File Edit View Insert Server Control Debug Tools Help
New Open... Save Undo Redo Up New Folder Init Reset Pause Step Go Stop Abort Mark
Input Files Schedule API Satellite Monitors
Altitude monitor
altdata$altitude (km)
Time (seconds)
Set decay speed
Toggle recorder

altdata$altitude	254	[km]
altdata$decayspeed	100	[km/s]
lowerAltitudeLimit	210	[km]
satelliteAscentSpeed	10	
thrusterOnOff	0	[1=on/0=off]
upperAltitudeLimit	280	[km]

Filename	Active	Current	Required	Status
Satellite.sim				
Satellite.model				
Satellite.sched				
<<no export file>>				
Scenarios				
Satellite.mdl	Yes			
MMIs				
Satellite.mmi				
Initial Conditions				
Verified.init	Yes			
Assumed.init	Yes			
User Program Definitions				

```
Simtime  Wallclock  Type  Message
startup                   async-main applied initial condition file: "/users/fl75708/EfoHome/Satellite/Assumed.init" no comm
0.0000   0.0012           async-main loading scenario "/users/fl75708/EfoHome/Satellite/Satellite.mdl"
0.0000   0.0500           async-main new client 'localhost.localdomain:SimulationCtrl' on socket 9 (uid=18157, gid=100, ov
0.0000   0.9962           clock simulator started at Thu Sep 16 08:34:52 2004
0.0000   0.9962           clock state transition from void to initialising
0.0000   1.0461           clock state transition from initialising to stand-by
```

Executing minbar.dutchspace.nl Test Controller Non Realtime v=1.00 252.7500 269.1308 Experimental

National Aerospace Laboratory NLR

Dutch Space

Atos Origin

Summary

EuroSim Mk4.0 is an engineering simulator to support the design, development and verification of space (sub) systems defined by ESA programmes of various scales. The facility provides a reconfigurable real-time execution environment with the possibility of man-in-the-loop and/or hardware-in-the-loop additions.
This document specifies the install procedure and hints to maintain the EuroSim installation.

Revision Record

Issue	Revision	Date	Reason for change	Changes
1		1997-Apr-14	document creation	
1	1	1997-May-02	update after internal review	
1	2	1997-Jun-02	update for SPR-1721	
1	3	1997-Jun-25	update for SPR-1771, SPR-1783 and SPR-1803	
1	4	1999-Nov-18	update for IRIX 6.5 port	
2	0	2000-Mar-03	official EuroSim Mk2 release	
2	1	2000-May-2	Mk2rev1 release: added Appendix D: *EuroSim RTI: HLA extension*	
2	2	2000-Oct-6	Mk2rev2 release: fixed SPR-1830, add installation dependency `a2ps`, add installation for Linux version	
3	0	2002-May-14	EuroSim Mk3 release	
3	1	2003-Sep-12	EuroSim Mk3.1 release	Updated requirements.
3	2	2004-Oct-08	EuroSim Mk3.2 release	
4	0	2006-Feb-23	EuroSim Mk4.0 release	

This document replaces two other documents:

- EuroSim Installation Guide (ING), FSS-EFO-TN-460
- EuroSim Installation Verification Procedure (IVP), FSS-EFO-PLN-513

These documents are consequently discontinued.

Contents

Chapter 1

Introduction

1.1 Purpose

The purpose of this document is twofold:

1. Specify the procedure to install EuroSim on a target system.
2. Provide some guidelines that might help the EuroSim facility manager to maintain EuroSim in an operational state.

1.2 Audience

This document is written for the EuroSim facility manager. The facility manager will be considered the owner of the EuroSim installation, and hence will also be referred to—for brevity—as *owner*. It is assumed that the facility manager is also the (computer) system administrator and thus has root privileges.

1.3 Scope

This document applies to EuroSim Mk4.0. It contains information on how to install EuroSim and to keep it in an operational state. For information on how to use EuroSim, one is referred to the *EuroSim Software User Manual* [SUM05]. For information pertaining to the latest release of EuroSim, please consult the *EuroSim Software Release Notes* [SRN05].

1.4 Document Structure and Notation

This document is laid-out as follows:

Introduction
Purpose of present document and references to other documents.

EuroSim Overview
Short overview of EuroSim in terms of environment variables, processes, files and directories that might help the owner to maintain the installation. It is not intended to provide a full file list, but only a description of the more important files and their use.

Pre-Installation
Prerequisites for the EuroSim installation: machine types, disk space, other software required, saving user data.

Installation & Customization
Procedure how to install and customize EuroSim.

Installation Verification Procedure
How to verify correct installation.

EuroSim projects and users
Some example strategies will be provided how to set up EuroSim projects, users and repositories.

System Problems
Suggestions for solutions in case of problems (log files, FAQ, SPR, helpdesk).

Document references are given with a mnemonic between square brackets, like [SUM05]; these mnemonics are listed in the bibliography on page 49.
For the procedures described in this document, the following notation is used:

Type `string`	Type 'string' at UNIX shell prompt using keyboard.
Choose *a:b:c*	Choose menu item 'c' from sub-menu 'b' from menubar option 'a', using mouse.
Select **item**	Select 'item' (usually an icon) using mouse.
Press **button**	Press button called 'button' with mouse.
`Literal text`	Literal text is written in Courier (monospaced) font.

1.5 Abbreviations

Abbreviation	Description
ANSI	American National Standardization Institute
API	Application Programming Interface
APT	Advanced Package Tool
ASAP	As Soon As Possible
BV	Besloten Vennootschap
EFO	EuroSim Follow-On
ESA	European Space Agency
ESTEC	European Space Technology Centre
F77	Fortran 77
FAQ	Frequently Asked Questions
FORTRAN	Formula Translator
DS	Dutch Space
GNAT	GNU Ada Translator
GNU	Not UNIX
GUI	Graphical User Interface
HTML	Hyper Text Mark-up Language
IRIX	SGI version of UNIX
IVP	Installation Verification Procedure
MB	Mouse Button
MB1	Left Mouse Button
MB2	Middle Mouse Button
MB3	Right Mouse Button
MIF	Maker Interchange Format

Abbreviation	**Description**
NIVR	Nederlands Instituut voor Vliegtuig en Ruimtevaartontwikkeling
NLR	Nationaal Lucht- en Ruimtevaart Laboratorium
PSS05	ESA's Software Engineering Standard
RAM	Random Access Memory
RCS	Revision Control System
ROM	Rough Order of Magnitude
SGI	Silicon Graphics Inc.
SPR	Software Problem Report
SR	System Requirement
SRN	Software Release Note
SUM	Software User Manual
SWRB	SoftWare Review Board
TBW	To Be Written
TC	Tele Command
TM	Telemetry
TN	Technical Note
URL	Universal Resource Locator
WWW	World Wide Web

Chapter 2

EuroSim Overview

The purpose of this section is to provide some background information on EuroSim, that might help you in maintaining the installed product.

2.1 EuroSim tools, models and libraries

The EuroSim product consists of a number of software *tools* and one or more software *libraries*. A software tool is an application, that runs on a host computer and assists the user in performing some task. Typical examples of EuroSim tools are the *Model Editor* and the *Simulation Controller*. All EuroSim tools are equipped with a modern Graphical User Interface.
The purpose of EuroSim is to assist the user in preparing simulators, running (real-time) simulations and analyzing the results. A simulator typically consists of a model, that makes the simulator specific for some application and an invariant part, that is the same for each simulator. The invariant part consists of the EuroSim tools, and one or more EuroSim libraries. These libraries provide a whole suite of functionality.

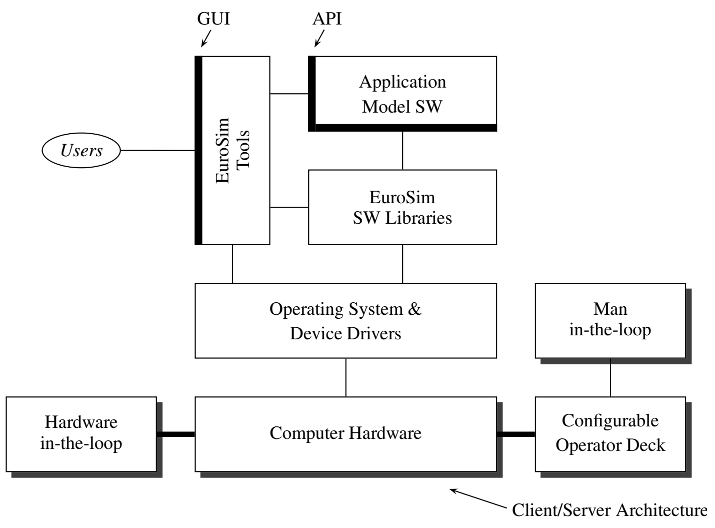


Figure 2.1: General lay-out of EuroSim: tools, model, libraries

There is a standard library called `esim`, that provides basic functionality, for example to look up the simulation time. Other libraries provide functionality for e.g. RS232, MIL1553, TM/TC interfaces.

2.2 EuroSim users and projects

The EuroSim *users* are the people on your system, using the EuroSim tooling to prepare, run and analyze simulations. Users can cooperate in a EuroSim simulation *project*. A EuroSim project consists of:

- A description.
- A directory where the files reside (also called the project root).
- A repository where the versioned files reside (for configuration control).
- A default model.

Project definitions can be kept in two places:

1. In a local EuroSim project description file. By setting the environment variable `EFO_HOME`, a user can override the default EuroSim project file in `$HOME/.eurosim`. A local project file (and there can be many of them) and the associated projects are managed by the user (see section 6.2). He/she can define projects at a local level. Projects and users are protected against each other by the normal OS protection mechanisms, which are respected by the EuroSim tooling.

2. In a system wide EuroSim project description file. This file is managed by you, the EuroSim owner (also called facility manager). Users must set the `EFO_HOME` environment variable to the directory with the system wide project file. You can use this file to create EuroSim projects and allocate a working directory (i.e. disk storage) to them.

2.3 EuroSim licenses and daemon `esimd`

EuroSim simulators are started via the EuroSim daemon[1] `esimd`. Through this daemon it is possible to run a simulation not only on the local machine, but also on any other machine in the network that has a EuroSim daemon running[2]. To prepare a host computer for the purpose of real-time simulations, root privileges are required: hence the EuroSim daemon will normally run with root privileges. Although the daemon is started as root, and the simulation processes start off being owned by root when running real-time, this only takes as long as is needed to set things up. Non-real-time simulators are never run as root. The root privileges are needed to isolate processors (daemon) and to run on these isolated processors (simulator).
The EuroSim daemon also serves as a *license manager*. The EuroSim daemon can only run on hosts listed in the EuroSim *license file*. All EuroSim tools will contact the EuroSim daemon to check whether their host is listed in the license file. As the EuroSim tools can check for the daemon over the network, the EuroSim daemon needs only to be installed on the host that will run the actual EuroSim simulation processes; this host is called the *simulation server*. EuroSim tools can thus run on a host without a license daemon, while simulations can only be run on a host that has EuroSim daemon running.
Three different license types are available for EuroSim:

User license
: This is the standard license, that allows the user to use the EuroSim functionality for model development, test preparation and execution (i.e. simulation) and test analysis.

Run-time license
: This is a scaled down license, that allows the user to use the EuroSim functionality for test preparation and execution (i.e. simulation) and test analysis. This requires the availability of a ready-to-run EuroSim simulator, prepared by Dutch Space BV or anyone else with a EuroSim user license.

[1]Under Windows NT, esimd is run as a service.
[2]Provided—of course—that that machine has equal access to your simulator files as the local machine, e.g. via NFS.

Developers license
This license allows the licensee to extend the EuroSim functionality and/or to integrate EuroSim with other software products, by having access to the EuroSim object code, header files and developers manual pages.

Your type of license is indicated on the EuroSim license agreement.

2.4 Lay-out of EuroSim installation

The directory structure under `/usr/EuroSim` (Windows NT: `C:\Eurosim`) is laid-out as follows.

Directory[3]	**Contents**	**Typical/important file**	**Description**
`adainclude`	Package specifications for Ada.	`esim.ads`	Ada package specification for `esim` library.
`bin`	All the EuroSim executables.	`esim`	EuroSim entry point.
`etc`	Miscellaneous files.	`user.sh`	Script that defines the environment variables needed.
		`EuroSim.licenses`	License file.
		`SoftwareReleaseNote`	Software release note [SRN05].
`include`	The include files for C and Fortran.	`esim.h`	C include for basic EuroSim functions.
`lib`	All EuroSim tcl, perl, python and java libraries. EuroSim shared object libraries (Linux).	`tcl, perl, python, java`	Tcl, perl, python and java EuroSim support.
`lib32`	EuroSim shared object libraries (IRIX).	`libes.so`	Library file of basic EuroSim functions.
`doc`	EuroSim html and pdf documentation.	`OM.pdf, SUM.pdf`	Owner's Manual and Software User's Manual.
`man`	The EuroSim manual pages.	`man1/esim.1`	Manual page for `esim` tool.
		`man3/esim.3`	Manual page for `esim` library.

Table 2.1: Lay-out of EuroSim installation (`/usr/EuroSim` directory)

[3]Starting at `/usr/EuroSim`

2.5 EuroSim environment variables

For its correct operation, EuroSim depends on a number of environment variables. The most important one is `$EFOROOT`, which has to point to where the EuroSim files are installed (i.e. `/usr/EuroSim`). `EFOROOT` and related environment variables are set automatically by EuroSim when using Linux and Windows. Under IRIX you have to set `$EFOROOT` yourself and source `$EFOROOT/etc/user.(c)sh`.

Name	Purpose
`EFO_HOME`	Optional. Points to the location of the EuroSim project file. If not set, then `$HOME/.eurosim` is used.
`LD_LIBRARYN32_PATH`	Shared library search path for n32 (new 32-bit ABI) programs [IRIX 6.x].
`MANPATH`	This variable is extended with `$EFOROOT/man`, so that the EuroSim manual pages can be found.
`PATH`	This variable is extended with `$EFOROOT/bin`, so that the EuroSim executables can be found.

Table 2.2: Environment variables needed before starting EuroSim

When the above environment variables are set, EuroSim can be started by typing `esim` on the command line. After selecting a project and role, some more environment variables are set automatically by EuroSim for that session. A complete list is given below for information.

Name	Purpose/meaning
`PROJECTHOME`	Home directory of the current project.
`EFO_XTERM`	The terminal emulation program (if not set `xterm` is used).
`EFO_VC`	The current configuration control system. Possible values are `cadese` or `cvs`. If not set, then no configuration control is used.
`EFO_SHAREDMEMSIZE`	The shared memory size used by the simulator. By default 4 MB is reserved. If more is needed then this environment variable should be set with the required memory size in bytes.
`EFO_STACKSIZE`	The stack size reserved for each thread of the simulator. By default 128k (IRIX) or 16k (Linux) is reserved. If more is needed then this environment variable should be set with the required stack size in bytes.

Table 2.3: Environment variables used within EuroSim

Note: additionally, one can set the environment variable `EFO_DAEMON` to the host that runs the EuroSim daemon, if that differs from the local host.

2.6 EuroSim user's files

EuroSim will create and/or look for certain files in the user's home and/or current working directory; details are listed below.

Directory	**Filename**	**Purpose**
`$HOME/.eurosim`	`projectmanagerrc`	Contains the user preferences and GUI settings for the Project Manager.
	`modeleditorrc`	Contains the user preferences and GUI settings for the Model Editor.
	`scheduleeditorrc`	Contains the user preferences and GUI settings for the Schedule Editor.
	`simulationctrlrc`	Contains the user preferences and GUI settings for the Simulation Controller.
	`testanalyzerrc`	Contains the user preferences and GUI settings for the Test Analyzer.
	`modeldescriptioneditorrc`	Contains the user preferences and GUI settings for the Model Description Editor.
	`parameterexchangeeditorrc`	Contains the user preferences and GUI settings for the Parameter Exchange Editor.
`$EFO_HOME`	`projects.db`	By setting `$EFO_HOME` to the directory where `projects.db` resides, one can override EuroSim's default project description file.
`$PROJECTHOME`	`.cadeserc`	This file defines the location of the project's repository for the Cadese tooling.

Table 2.4: EuroSim user files

Chapter 3

Pre-Installation (system requirements)

The purpose of this section is to list the requirements to be met to allow EuroSim to be installed and run. Some requirements are mandatory, while other are optional, depending on the user's requirements for the related EuroSim functionality. Optional requirements are clearly marked as such.

3.1 SGI IRIX

ReqID	**Requirement**	**Remarks**
IR–1	Host computer shall be a Silicon Graphics Indy, O2, Indigo, Challenge, Onyx or Origin.	
IR–2	Host operating system shall be IRIX 6.5.20m or better.	
IR–3	Host RAM shall be 512 MB or more.	
IR–4	Free disk space shall be 85 MB or more	Needed for EuroSim installation.
IR–5	Basic development system (C compiler and linker) shall be available, version 7.3.	Not required for run-time license.
IR–6	F77 compiler shall be available, version 7.3.	Only required when using F77 sub-models.
IR–7	Ada environment 'GNAT Ada95 v1.3' shall be available.	Only required when using Ada sub-models.
IR–8	PV-Wave, version 6.x shall be available.	Only required when using EuroSim's test-analysis functionality with the PV-Wave back end.
IR–9	Gnuplot shall be available.	Only required when using EuroSim's test analysis functionality with the gnuplot back end.
IR–10	FrameMaker version 4.x shall be available.	Only required when using Frame MIF file for model documentation.
IR–11	NetScape version 4.07 or higher shall be available.	Only required for on-line availability of the EuroSim SUM.

3.2 i386 Linux

ReqID	Requirement	Remarks
IR–1	Host computer shall be an Intel Pentium compatible PC or better.	
IR–2	Linux distribution shall be RedHat 8.0.	Packages for RedHat 7.3 (client libraries only), RedHat 9.0, Fedora Core 1, 2, 3 and 4, SuSE 9.1 and 9.2 and Debian 3.1 are also available. However, the EuroSim test campaign is only performed for RedHat 8.0.
IR–3	Host RAM shall be 512 MB or more.	
IR–4	Free disk space shall be 100 MB or more.	Needed for EuroSim installation.
IR–5	Basic development system (C compiler, linker and make) shall be available.	Not required for run-time license part of RedHat distribution.
IR–6	F77 compiler shall be available.	Part of Linux distribution. Only required when using F77 sub-models.
IR–7	Ada compiler shall be available.	Part of Linux distribution. Only required when using Ada sub-models.
IR–8	RCS shall be available.	Part of Linux distribution. Only required when using configuration control with the cadese backend.
IR–9	CVS shall be available.	Part of Linux distribution. Only required when using configuration control with the cvs backend.
IR–10	Perl 5.8.0 shall be available.	Part of Linux distribution. Only required when using the batch utility.
IR–11	Readline 4.3 shall be available.	Part of Linux distribution. Only required when using the batch utility.
IR–12	PV-Wave, version 6.x shall be available.	Only required when using EuroSim's test analysis functionality with the PV-Wave back end.
IR–13	Gnuplot shall be available.	Part of Linux distribution. Only required when using EuroSim's test analysis functionality with the gnuplot back end.
IR–14	FrameMaker version 4.x or higher shall be available.	Only required when using Frame MIF file for model documentation.
IR–15	Mozilla shall be available.	Part of Linux distribution. Only required for on-line availability of the EuroSim SUM.

3.3 Windows NT

ReqID	Requirement	Remarks
IR–1	Host computer shall be an Intel Pentium compatible PC or better.	

ReqID	**Requirement**	**Remarks**
IR–2	Operating System shall be either Windows NT, Windows 2000 or Windows XP (SP 1 or 2).	
IR–3	Host RAM shall be 512 MB or more.	
IR–4	Free disk space shall be 500 MB or more.	Needed for EuroSim and Cygwin installation.

Chapter 4

Installation & Customization

This section lists—step by step—the procedure to install EuroSim on a computer system. This procedure can be used for a first time installation, as well as for any subsequent installations, e.g. installing a new version.

IMPORTANT NOTICE:

You might want to save the license file `/usr/EuroSim/etc/EuroSim.licenses` from an existing EuroSim installation.

4.1 EuroSim installation procedure for IRIX

Step	**Description**
4.1–1	Log in to the system as ‘root’.
4.1–2	Insert the EuroSim CD-ROM. After some time the CD-ROM is mounted automatically under `/CDROM`.
4.1–3	You should have at least 180 MB free disk space in `/usr`. The main portion will be installed in `/usr/EuroSim`.
4.1–4	Start the `swmgr`.
4.1–5	By default only the EuroSim base software is selected for installation. You will also see various other packages selected for installation. These packages are required by EuroSim. There are also three device drivers available for installation. Choose the driver for the devices present in your computer.
4.1–6	If you want to use the `r2hdf` command which converts EuroSim recorder files into HDF5 data files, you also need to select the `HDF5` package for installation.
4.1–7	Hit the start button to install the software. In case you have installed one of the device drivers the system will need a reboot.

IMPORTANT NOTICE:

The following steps are only required if this is a first-time installation.

Step	Description

4.1–8	Edit `/etc/services` or NIS equivalent and add the following (depending on local configuration you may of course use other port-numbers) ports:
	
	`esim-client-0     4850/tcp`
	`esim-client-1     4851/tcp`
	`esim-client-2     4852/tcp`
	`esim-client-3     4853/tcp`
	`esim-client-4     4854/tcp`
	`esim-client-5     4855/tcp`
	`esim-client-6     4856/tcp`
	`esim-client-7     4857/tcp`
	`esim-client-8     4858/tcp`
	`esim-client-9     4859/tcp`

4.1–9	Add the following line at the end of `/var/sysgen/stune`:
	
	`% the following setting removes the ''must run'' attribute`
	`% from netproc threads which allows those threads to run`
	`% anywhere, therefore removing the impact on real-time CPU's`
	`netthread_float = 1`

4.1–10	Determine the pagesize of your system by running `sysconf PAGESIZE`. If the result is 4096 then add at the end of `/var/sysgen/stune`:
	
	`maxlkmem = 16384`
	
	If the result is 16384 then add at the end of `/var/sysgen/stune`:
	
	`maxlkmem = 4096`
	
	This value determines the maximum locked memory size: `maxlkmem` x pagesize = maximum locked memory.

4.1–11	Add the following lines to `/var/sysgen/system/irix.sm`. Place them after a paragraph mentioning this option. Add as many processors to the variable `NOINTR` as there are in your machine minus the first processor (0). The example below is for a four processor Origin 200. `NOINTR: 1 2 3`

4.1–12	In case EuroSim will be configured for the use of external interrupt 1 the following variable `DEVICE_ADMIN` has to be added to the above mentioned file, e.g. (check exact device path!):
	
	`DEVICE_ADMIN: /hw/module/1/slot/MotherBoard/node/xtalk/8/pci/3 \`
	`INTR_TARGET=/hw/cpunum/1`
	
	For external interrupt 2 add the following line (check exact device path!):
	
	`DEVICE_ADMIN: /hw/module/2/slot/MotherBoard/node/xtalk/8/pci/3 \`
	`INTR_TARGET=/hw/cpunum/2`

Step	**Description**

4.1–13	For the IRIG-B interface board add the following line for Origin 200 systems (check exact device path!):
	`DEVICE_ADMIN: /hw/module/1/slot/MotherBoard/node/io/8/pci/5 \`
	`INTR_TARGET=/hw/cpunum/1`
	For Origin 300 systems add the following lines (check exact device path):
	`DEVICE_ADMIN: /hw/module/001p02/Pbrick/xtalk/14/pci \`
	`INTR_TARGET=/hw/cpunum/1`
	`DEVICE_ADMIN: /hw/module/001p02/Pbrick/xtalk/14/pci/1/tfp \`
	`INTR_TARGET=/hw/cpunum/1`

4.1–14	For the PCI-VME bridge add the following line for Origin 200 systems (check exact device path!):
	`DEVICE_ADMIN: /hw/module/2/slot/MotherBoard/node/io/8/pci/5 \`
	`INTR_TARGET=/hw/cpunum/2`
	For Origin 300 systems add the following lines (check exact device path):
	`DEVICE_ADMIN: /hw/module/001p02/Pbrick/xtalk/12/pci \`
	`INTR_TARGET=/hw/cpunum/2`
	`DEVICE_ADMIN: /hw/module/001p02/Pbrick/xtalk/12/pci/1 \`
	`INTR_TARGET=/hw/cpunum/2`

4.1–15	For the VMIC Reflective Memory card add the following line for Origin 200 systems (check exact device path!):
	`DEVICE_ADMIN: /hw/module/2/slot/MotherBoard/node/xtalk/8/pci/7 \`
	`INTR_TARGET=/hw/cpunum/2`
	For Origin 300 systems add the following lines (check exact device path):
	`DEVICE_ADMIN: /hw/module/001p02/Pbrick/xtalk/13/pci \`
	`INTR_TARGET=/hw/cpunum/2`
	`DEVICE_ADMIN: /hw/module/001p02/Pbrick/xtalk/13/pci/1/rfm \`
	`INTR_TARGET=/hw/cpunum/2`

4.1–16	To activate the new `stune` variables, reboot the system twice, or run `/etc/autoconfig` and reboot once.

4.2 EuroSim installation procedure for Linux (not Debian)

If you are installing EuroSim on a Debian distribution, then go to section 4.3.

Step	Description
4.2–1	Log in to the system as ‘root’.
4.2–2	Insert and mount the EuroSim CD-ROM.
4.2–3	Change directory to the `linux` subdirectory on the CD-ROM.
4.2–4	You should have at least 100 MB free disk space in `/usr`. The main portion will be installed in `/usr/EuroSim`.
4.2–5	Install Linux kernel with POSIX timer patch. (Only required for 2.4 kernel based distributions. If you have a Linux 2.6 kernel based distribution then go to step 4.2–9.) `rpm -ivh kernel-2.4.20-18.timer.i386.rpm` Several kernel versions are available. Choose the one that matches your hardware best.

4.2–6	If you are using the Grub bootloader, then go to step 4.2–9. Add the lines below to `/etc/lilo.conf` and replace `/dev/hda5` with your boot disk/partition:
	
	`image=/boot/vmlinuz-2.4.20-18.timer`
	`        label=linux-timer`
	`        initrd=/boot/initrd-2.4.20-18.timer.img`
	`        read-only`
	`        root=/dev/hda5`

4.2–7	Optional: to make this kernel the default kernel add/replace the line with `default` in `/etc/lilo.conf`: `default=linux-timer`
4.2–8	Run `lilo` to make the kernel accessible from the boot menu.
4.2–9	Install `hdf5` package `rpm -Uvh hdf5-1.2.2-1.i386.rpm`
4.2–10	Install `gnuplot` package from Linux installation CD (if not already installed by default). Actual version number may differ from the example below depending on the used distribution. `rpm -Uvh gnuplot-4.0.0-4.i386.rpm`
4.2–11	Install `expect` package from Linux installation CD (if not already installed by default). Actual version number may differ from the example below depending on the used distribution. `rpm -Uvh expect-5.42.1-1.i386.rpm`

Step	**Description**
4.2–12	Install qt. This is not required if you install the EuroSim client package only. This is only required on the following distributions: RedHat 8.0, RedHat 9, Fedora Core 1. The EuroSim GUIs require a newer qt version than is shipped with RedHat. The new qt must be installed alongside the existing qt. So *don't* use the `-U` option when running `rpm`. `rpm -ivh qt-3.3.2-0.i386.rpm`
4.2–13	Install `make` package. This is only required on SUSE Linux 9.1 and SUSE Linux 9.2. `rpm -Uvh --oldpackage make-3.80-5.i386.rpm`
4.2–14	Install EuroSim `rpm -Uvh eurosim-4.0-1.rh8.i386.rpm` If you only need the client libraries, then instead of installing the `eurosim-4.0-1.rh8.i386.rpm` you can install `eurosim-client-4.0-1.rh8.i386.rpm`. Replace `rh8` by `rh73` (RedHat 7.3), `rh9` (RedHat 9), `fc1` (Fedora Core 1), `fc2` (Fedora Core 2), `fc3` (Fedora Core 3), `fc4` (Fedora Core 4), `suse91` (SUSE Linux 9.1) or `suse92` (SUSE Linux 9.2) when installing on the corresponding Linux distribution.
4.2–15	Install EuroSim batch utility `rpm -Uvh perl-*.rpm`
4.2–16	Reboot with the new kernel. This is only required if you have installed the special kernel before. `reboot` When the lilo or grub prompt appears select the `linux-timer` kernel. To prevent booting the wrong kernel for EuroSim perform step 4.2–7. This makes the patched kernel the default. No specific actions have to be performed at boot time.

4.3 EuroSim installation procedure for Debian Linux

If you are not installing EuroSim on a Debian distribution, then go to section 4.2.

Step	Description
4.3–1	You should have at least 100 MB free disk space in `/usr`. The main portion will be installed in `/usr/EuroSim`.
4.3–2	Log in to the system as ‘root’.
4.3–3	Insert and mount the EuroSim CD-ROM.

4.3–4	Modify the `/etc/apt/sources.list` file such that the `Packages.gz` file can be found on the EuroSim CD-ROM. Your `/etc/apt/sources.list` should look something like this (last line points to the CD-ROM).
	`deb http://ftp.nl.debian.org/debian/ stable main`
	`deb-src http://ftp.nl.debian.org/debian/ stable main`
	`deb http://security.debian.org/ stable/updates main`
	`deb file:///mnt/cdrom/linux /`

4.3–5	Update the APT database `apt-get update`
4.3–6	Install the EuroSim package `apt-get install eurosim` If you only need the client libraries, then instead of installing the `eurosim` package you can install the `eurosim-client` package. You will be informed about missing packages that EuroSim depends on. They are automatically downloaded and installed.
4.3–7	Optionally install Perl support for EuroSim `apt-get install perl-eurosim`

4.4 EuroSim installation procedure for Windows NT

Step	Description
4.4–1	Ensure that you have a valid license file `EuroSim.licenses` available (f.i. on a diskette).
4.4–2	Log in to the system as 'Administrator' (or as a user with Administrator privileges).
4.4–3	Insert the EuroSim CD-ROM.
4.4–4	Run the `setup` program. (See document *Installation notes* in the windows directory on the EuroSim CD-ROM for details.)

4.5 Starting the EuroSim daemon under IRIX

A license key is required to start the EuroSim daemon. Normally, the key for your system will already be included in the license file `/usr/EuroSim/etc/EuroSim.licenses`.
If you need a new licenses key, you can mail that request to `esim-info@dutchspace.nl`, providing the following info:

1. The reference number of your EuroSim license agreement.
2. Your computer's name, type and OS version.
3. All the first non-zero characters (letters, digits) of the output of the `sysinfo` command.

Now, proceed as follows (still as user 'root', and assuming this is a first-time installation).

Step	Description
4.5–1	Append your license key (a string starting with `EuroSim`) to the license file: `# cat >> /usr/EuroSim/etc/EuroSim.licenses` Usually this step is not needed.
4.5–2	Do: `# chkconfig -f esim on` to make sure the daemon will start-up when told to do so.
4.5–3	Start the daemon: `# /etc/init.d/esim start` To stop the daemon again you should do: `# /etc/init.d/esim stop`

When only an EuroSim update has been installed, it is wise to stop and start the EuroSim daemon (step 4.5–3), to make sure that the running `esimd` is compatible with the new version of EuroSim.
As delivered, the EuroSim daemon will write simulator messages[1] to `esimd.`hostname`.log` in directory `/var/adm`. You can configure that by editing the file `/etc/init.d/esim`. By leaving out the `-l` switch altogether, the EuroSim daemon will write its messages to the system's console.
To prevent the daemon log file from growing out of bounds, you may want to add an entry to your system's crontab to cycle it daily, weekly or monthly. For example, adding:

[1]The daemon writes its own messages to syslog, and routes the messages from started simulators to the indicated log file. So, what is in the log file, is in fact, output from EuroSim simulators.

```
0 5 * * * /usr/EuroSim/etc/esim.cron
```

to your root's crontab will cycle the contents of the file overnight. The script will keep 5 older log files. For more information on the EuroSim daemon, see `man esimd`.

4.6 Starting the EuroSim daemon under Linux

A license key is required to start the EuroSim daemon. Normally, the key for your system will already be included in the license file `/usr/EuroSim/etc/EuroSim.licenses`.
If you need a new licenses key, you can mail that request to `esim-info@dutchspace.nl`, providing the following info:

1. The reference number of your EuroSim license agreement.
2. Your computer's name, type and OS version.
3. The first line of the output of the `sysinfo` command. The information produced uses the MAC address of the first Ethernet card present in the system. If there is no Ethernet card present in your system, you cannot get a license for EuroSim.

Now, proceed as follows (still as user 'root', and assuming this is a first-time installation).

Step	**Description**
4.6–1	Append your license key (a string starting with `EuroSim`) to the license file: `cat >> /usr/EuroSim/etc/EuroSim.licenses` Usually this step is not needed.

4.6–2	Start the daemon:
	 `# /etc/init.d/esim start`
	 To stop the daemon again you should do:
	 `# /etc/init.d/esim stop`

When only an EuroSim update has been installed, it is wise to stop and start the EuroSim daemon (step 4.6–2), to make sure that the running `esimd` is compatible with the new version of EuroSim.
As delivered, the EuroSim daemon will write simulator messages[2] to `esimd.`hostname`.log` in directory `/var/log`. You can configure that by editing the file `/etc/init.d/esim`. By leaving out the `-l` switch altogether, the EuroSim daemon will write its messages to the system log file `/var/log/messages`. Not all messages are logged however. If you want to see all messages you must make a minor modification to the file `/etc/syslog.conf`. Just add `;local0.*` to the list of filters which write to `/var/log/messages`. The line would then look something like:

```
*.info;mail.none;authpriv.none;cron.none;local0.* /var/log/messages
```

To prevent the daemon log file from growing out of bounds, you may want to add an entry to your system's crontab to cycle it daily, weekly or monthly. For example, adding:

```
0 5 * * * /usr/EuroSim/etc/esim.cron
```

to your root's crontab will cycle the contents of the file overnight. The script will keep 5 older log files. For more information on the EuroSim daemon, see `man esimd`.

[2]The daemon writes its own messages to syslog, and routes the messages from started simulators to the indicated log file. So, what is in the log file, is in fact, output from EuroSim simulators.

4.7 Starting the EuroSim daemon under Windows NT

A license key is required to start the EuroSim daemon. Normally, the key for your system will already be included in the license file `EuroSim/etc/EuroSim.licenses` (the EuroSim installer program will ask you for a license file).
If you need a new licenses key, you can mail that request to `esim-info@dutchspace.nl`, providing the following info:

1. The reference number of your EuroSim license agreement.
2. Your computer's name, type and OS version.
3. The first line of the output of the `$EFOROOT/bin/sysinfo` command. The information produced uses the MAC address of the first Ethernet card present in the system. If there is no Ethernet card present in your system, you cannot get a license for EuroSim.

In the event of license prolongation, proceed as follows:

Step	**Description**
4.7–1	Append your license key (a string starting with `EuroSim`) to the license file `EuroSim.licenses`.
4.7–2	Stop the EuroSim daemon. Open a command shell and type the following command followed by the Enter key: `net stop esimd`
4.7–3	Start the EuroSim daemon. Open a command shell and type the following command followed by the Enter key: `net start esimd`

The EuroSim daemon is implemented as a Windows *service*. As an alternative to typing the *net start* and *net stop* commands, you can open the Service Control Manager (SCM) from the Windows Control Panel and start/stop the EuroSim daemon from there. It's name is `esimd`.
The EuroSim daemon writes event messages to the application event log. Use the Windows *Event Log* program to view them.

Chapter 5

Installation Verification Procedure

In order to write down the procedures as compactly as possible, the procedure steps are often specified at a higher level of abstraction. E.g. instead of saying 'Choose *Create:New:Project* and type project `my_project` and then press **OK**' it is simply written 'Create new project `my_project`'. Consult [SUM05] for details.
Optional steps are indicated by a procedure step number in a grey field; the condition is listed directly above that grey field.

5.1 IRIX

5.1.1 Host system

Purpose: verify that host is compatible with EuroSim.

Step	**Procedure**	**Expected Result**	**Checked**
5.1–1	Inspect host system make.	Should be a Silicon Graphics Indy, Indigo, Challenge, Onyx or Origin.	
5.1–2	Note processor type (use `hinv`).	Should be MIPS R4xxx for Indy, Indigo, Challenge or Onyx. Should be MIPS R5000 or R10000 for O2. Should be MIPS R10000 for Origin 200, Origin 2000 or Onyx 2. Should be MIPS R14000 for Origin 300.	
5.1–3	Note memory size (use `hinv`).	Item should be $\geq$512 MB.	
5.1–4	Note free disk space (use `df .`).	Free disk space should be $\geq$100 MB.	

5.1.2 Host operating system

Purpose: verify that host's operating system is compatible with EuroSim.

Step	**Procedure**	**Expected Result**	**Checked**
5.1–5	Inspect operating system (use `/bin/uname -R`).	Should be Silicon Graphics IRIX version 6.5.20m.	

5.1.3 Third party software

Purpose: verify required third party software; note any exceptions.

Step	Procedure	Remark	Result	Checked
5.1–6	Check basic development system is available (use `showprods`)	Not required for EuroSim run-time license.	c_fe (C Front-end, 7.4), c_dev (C Headers and Libraries, 7.4), compiler_eoe (IRIX Standard Execution Environment (Base Compiler Headers and Libraries, 7.4)) installed.	
5.1–7	Check if the F77 compiler is available.	Optional.	ftn77_fe (Fortran 77 Front-end, 7.4), f77_dev (Fortran 77 Headers and Libraries, 7.4) installed.	
5.1–8	Check if the Ada compiler is available.	Optional.	gnat_dev (GNAT Ada95 v1.3), gnat_eoe (GNAT Ada 95 v1.3) installed.	
5.1–9	Check if the C++ compiler is available.	Optional.	c++_fe (C++ Front-end, 7.4), c++_eoe (Standard Execution Environment (C++ Headers and Libraries, 7.4)), c++_dev (C++ Headers and Libraries, 7.4) installed.	
5.1–10	Check if the RCS utilities are available.	Optional.	eoe.sw.rcs (Revision Control System Utilities) installed.	
5.1–11	Check if the CVS utilities are available.	Optional.	fw_cvs (cvs-1.11.6 Concurrent Versions System) installed.	
5.1–12	Check if PV-Wave is available.	Optional.	Version 6.x installed.	
5.1–13	Check if FrameMaker is available.	Optional.	Version 4.x installed.	
5.1–14	Check if Netscape is available.	Optional.	Version 4.72 or higher installed.	

5.2 Linux

5.2.1 Host system

Purpose: verify that host is compatible with EuroSim.

Step	Procedure	Expected Result	Checked
5.2–1	Note processor type (use `hinv`).	Should be Intel Pentium or better.	
5.2–2	Note memory size (use `hinv`).	Should be $\geq$512 MB.	

Step	Procedure	Expected Result	Checked
5.2–3	Note free disk space (use `df .`).	Free disk space should be ≥100 MB.	

5.2.2 Host operating system

Purpose: verify that host's operating system is compatible with EuroSim.

Step	Procedure	Expected Result	Checked
5.2–4	Inspect operating system (use `uname -sr`).	Should be Linux 2.4.20-18.timer or Linux 2.6.*.	

5.2.3 Third party software

Purpose: verify required third party software; note any exceptions.

Step	Procedure	Remark	Result	Checked
5.2–5	Check basic development system is available (use `rpm -qa` for RedHat Linux, Fedora Core and SUSE Linux, use `dpkg -l` for Debian Linux).	Not required for EuroSim run-time license.	gcc-3.2-7 or higher installed.	
5.2–6	Check if the F77 compiler is available.	Optional.	gcc-g77-3.2-7 or higher installed. Fedora Core 4 requires compat-gcc-32-g77-3.2	
5.2–7	Check if the Ada compiler is available.	Optional.	gcc-gnat-3.2-7 or higher installed.	
5.2–8	Check if the C++ compiler is available.	Optional.	gcc-c++-3.2-7 or higher installed.	
5.2–9	Check if the RCS utilities are available.	Optional.	rcs-5.7-18 or higher installed.	
5.2–10	Check if the CVS utilities are available.	Optional.	cvs-1.11.5-2 or higher installed.	
5.2–11	Check if PV-Wave is available.	Optional.	Version 6.x installed.	
5.2–12	Check if FrameMaker is available.	Optional.	Version 4.x installed.	
5.2–13	Check if Mozilla is available.	Optional.	Version 1.0 or higher installed.	

5.3 Windows

5.3.1 Host system

Purpose: verify that host is compatible with EuroSim.
Use *Control Panel:System* to get system information.

Step	**Procedure**	**Expected Result**	**Checked**
5.3–1	Note processor type.	Should be Intel Pentium or better.	
5.3–2	Note memory size.	Should be $\geq$512 MB.	
5.3–3	Note free disk space.	Free disk space should be $\geq$500 MB.	

5.3.2 Host operating system

Purpose: verify that host's operating system is compatible with EuroSim.

Step	**Procedure**	**Expected Result**	**Checked**
5.3–4	Inspect operating system.	Should be Windows NT ($\geq$4.0), Windows 2000 or Windows XP.	

5.4 Exercise a number of the EuroSim tools/functionalities

Purpose: test proper functioning of EuroSim on (new) host.

Step	**Tool**	**Procedure**	**Result**	**Checked**
5.4–1		Prepare user environment as described in section 6.1	Environment variables set.	
5.4–2	Project Manager	Linux/UNIX: type `esim`; Windows: double click desktop icon	Project Manager tool appears.	
5.4–3	Project Manager	Choose *Help:About*	About dialog appears with version number.	
5.4–4	Project Manager	Create new project `IVP`.	Project `IVP` appears in the Project Manager.	

Only perform step 5.4–5 if Netscape or Mozilla[1] is needed/installed:

Step	**Tool**	**Procedure**	**Result**	**Checked**
5.4–5	Netscape or Mozilla	Choose *Help:Contents* in the Project Manager.	Index to all on-line documentation appears on screen.	
5.4–6	Project Manager	Select project `IVP` and press the **Model Editor** button	Model Editor starts with empty canvas.	

[1]On Windows the viewer associated with .html documents will be started

Step	**Tool**	**Procedure**	**Result**	**Checked**
5.4–7	Model Editor	Attach file node `ansi.c` and edit file to insert code as per Appendix A. View file (*Edit:View Source*) and save model as `IVP.model`.	Model hierarchy extended with file node; source code editor starts correctly; source code viewer starts correctly.	
5.4–8	Model Editor	Expand node `ansi.c`.	Variables and procedures that are candidates for the API are shown.	
5.4–9	Model Editor	API-fy variables `c_y`, `c_ampl`, `c_freq` and entry point `ansi_c` by checking the corresponding checkboxes in the listview.	Selected variables appear with checkmark.	

Only perform step 5.4–10 if Fortran is needed/installed:

Step	**Tool**	**Procedure**	**Result**	**Checked**
5.4–10	Model Editor	Make file node `fortran.f`. Insert code as per Appendix A (be sure to insert 6 spaces at the beginning of each line according to the Fortran 77 syntax rules). Select *Tools:Set Build Options* and select **Linux**[2] **Fortran runtime libraries** in the Support tab. Select **OK**. API-fy variables.	API-fiable variables and procedures are shown. Selected variables appear with checkmark.	

Only perform step 5.4–11 if Ada is needed/installed:

Step	**Tool**	**Procedure**	**Result**	**Checked**
5.4–11	Model Editor	Make Org node `ada` and attach file nodes `mada.adb`[3] and `mada.ads`. Insert code as per Appendix A, but do not copy/paste it from HTML browser or PDF viewer. Instead, copy them from `$EFOROOT/src/IVP` (note: including the API header).	Specified API items appear on canvas (after a number of warnings for incomplete model).	
5.4–12	Model Editor	Add file node `IVP.env`. Choose *Edit:Edit Source*. Press **Get Current Environment** and save.	Environment editor starts up and loads current environment.	

[2] Or Irix or Windows, depending on your platform
[3] GNAT doesn't allow a file called `ada.xxx`.

Step	**Tool**	**Procedure**	**Result**	**Checked**
5.4–13	Model Editor	Choose *Edit:View Source*.	Environment viewer starts OK and shows no difference between stored and current environment.	

Only perform step 5.4–14 if FrameMaker[4] is needed/installed:

Step	**Tool**	**Procedure**	**Result**	**Checked**
5.4–14	FrameMaker	Create a file `Model.mif` with FrameMaker add the file to the model. Choose *Edit:Edit Source*. Save (as MIF) and exit.	FrameMaker starts and shows the file created earlier.	
5.4–15	Model Editor	Choose *Tools:Set Build Options*. Select **Gnat Ada runtime libraries**.	*Build Options* window appears.	
5.4–16	Model Editor	Choose *Tools:Build All*.	Makefile, `.exe` and `.dict` are successfully generated.	
5.4–17	Project Manager	Press **Schedule Editor**.	Schedule Editor starts with empty schedule.	
5.4–18	Schedule Editor	Select *File:Select Model* and choose the model created earlier. For the executing state (*View:Executing*), schedule the C, F77 and Ada entry points (as appropriate) periodically, e.g. at 20, 10 and 5 Hz respectively. Save and exit.	No problem.	
5.4–19	Project Manager	Press **Simulation Controller**.	Simulation Controller starts OK with empty canvas.	
5.4–20	Simulation Controller	Press *File:New* to choose model and schedule. Choose model `IVP.model` and schedule `IVP.sched`. Select API tab page.	Wizard appears. API tab shows `IVP.model` data dictionary.	
5.4–21	Simulation Controller	Select *Insert:New MMI* and call the new MMI `IVP.mmi`. Select *Insert:New Monitor* and select variable `ansi:ansi_c:y`. Change to plot against simulation time and save as `ansi_c_y vs t`.	A new MMI tab appears. Monitor editor starts. Monitor appears on MMI tab.	

[4]Create a file `Model.doc` for Windows platforms. The editor associated with .doc files will be started.

Step	Tool	Procedure	Result	Checked
5.4–22	Simulation Controller	Select *Insert:New Scenario* and call the new scenario `IVP.mdl`. Choose *Insert:New Recorder*. Select var `ansi:ansi_c:y` and save as `ansi_c_y`.	Action editor starts. Recorder icon appears on canvas.	
5.4–23	Simulation Controller	Choose *Insert:New Initial Condition*. When prompted to save the file, save if as `IVP.init`.	The initial condition editor appears.	
5.4–24		Change initial condition of variable `ampl`. Press **OK**.	The *Input Files* tab shows the new initial condition file.	
5.4–25	Simulation Controller	Choose *Server:Select Server*.	A dialog with a list of available servers is shown.	
5.4–26	Simulation Controller	Press **Init**.	You are asked to save the changes: save the `.sim` file as `IVP.sim`. The simulator initializes and reaches `stand-by` state. Ignore warnings on inconsistent default values in the Fortran model; this is a known SPR.	
5.4–27	Simulation Controller	Press **Go**.	State changes to *executing*. The simulation time is continuously incremented. Recording action on scenario tab has status `EA` (executing and active). Monitor on the MMI tab is continuously updated and shows a sinus. The variables on the API tab are continuously updated.	
5.4–28	Simulation Controller	Create alpha numeric monitor and check that the initial condition (see step 5.4–24) has been set correctly. Enter another value on-line.	Variable's value is OK. Observe effect in time history plot.	
5.4–29	Simulation Controller	Press **Pause**. Press **Stop**. Choose *File:Exit*.	Simulator reaches *unconfigured* state.	
5.4–30	Project Manager	Press **Test Analyzer**	Test Analyzer starts OK with empty canvas.	
5.4–31	Test Analyzer	Select *File:Select test result file*. Select: `IVP.model.tr` (in sub-directory `<date>/<time>/`).	File selector appears. Recording file `ansi_c_y.rec` appears on screen.	

Step	**Tool**	**Procedure**	**Result**	**Checked**
5.4–32	Test Analyzer	Choose *View:Expand all nodes*. Select variable `ansi_c:y`. Drop variable on Test Analyzer's canvas. Select **Next**, **Next** and **Finish**.	Hierarchy is shown. Plot editor appears showing variable. `simulation_time` is listed as X variable. Plot icon appears on canvas and a window with the graph appears.	
5.4–33	Test Analyzer	Select plot icon. Choose *File:Print*. Note that the plot backend print dialog may be hidden behind an application window. Choose *Tools:Plot Backend Interface*.	Plot is printed. Plot backend command log appears, indicating plot is spooled to printer.	
5.4–34	Test Analyzer	Choose *File:Exit* and discard results.	Test Analyzer window disappears.	
5.4–35	Project Manager	Choose *File:Exit*.	The Project Manager disappears.	

Conclusion

Test successfully executed:

EuroSim version	
Hostname	
OS version	
Tester's name	
Date	
Remarks	

Chapter 6

EuroSim Projects & Users

6.1 Adding a EuroSim user

6.1.1 Adding a EuroSim user under Linux/UNIX

When a user of your system wants to start using EuroSim, he/she should do the following:

Step	**Description**	**Remarks**
6.1–1	`export EFOROOT=/usr/EuroSim`	IRIX only.
6.1–2	`export EFO_HOME=xxx`	Optional. By default `~/.eurosim` will be used.
6.1–3	`.  $EFOROOT/etc/user.sh`	IRIX only.

Table 6.1: EuroSim user set-up for `/bin/sh` or `bash`

Step	**Description**	**Remarks**
6.1–4	`setenv EFOROOT /usr/EuroSim`	IRIX only.
6.1–5	`setenv EFO_HOME xxx`	Optional. By default `~/.eurosim` will be used.
6.1–6	`source $EFOROOT/etc/user.csh`	IRIX only.

Table 6.2: EuroSim user set-up for `/bin/csh`

6.1.2 Adding a EuroSim user under Windows

When a user of your system wants to start using EuroSim, he/she should set the `EFO_HOME` environment variable to point to the directory where the project files are created. On Windows NT, open the Control Panel (*Start:Settings:Control Panel*) and double click the *System* icon. Select the *Environment* tab and add the `EFO_HOME` variable. Whether you add the variable to the list of System Variables or User Variables depends on whether you want to share your project directory with other users or keep your projects in a private directory (i.e. not shared). Make sure that the directory name does not contain spaces.

6.2 Adding a EuroSim project

A EuroSim project simply consists of an entry in a EuroSim project database. By setting `$EFO_HOME` to the directory where the project database resides, the user can select a project from the list and execute

one or more of the tools. How to add a EuroSim project is described in [SUM05], section 5.
If you use a shared project database, every user can access any project listed there. If you want to avoid this, you should use the Operating System's file protection mechanism. Various possibilities exist[1], and the following is given as a starting point only.

When using the system-wide EuroSim project description file

1. The file `$EFO_HOME/project.db` is readable by everybody but writable by `user=root` or `group=sys` only. The normal user can thus not change its contents.

2. When you create a new project (by editing the afore mentioned project description file) also create a new UNIX group and add the users working on the project to this group. Make the project's home directory of this group, and set the group `s`-bit. Make the directory writable to group members only. You may either make it readable to everybody or to the group only, depending on security requirements.

When using local EuroSim project description files

By default every user creates a local project database and can create projects. He/She is only bound by the standard UNIX protection mechanisms you have set up as a system administrator.
As an intermediate between the two extremes sketched above, you might consider the use of a *project librarian*. This librarian is made responsible for the maintenance of a local project description file, of which he/she is made the owner. Make the project description file writable by the owner exclusively, and place it in a new directory. Create a new UNIX group, and make the aforementioned directory read/write by this group and set the group `s`-bit. Assign the people wishing to use this project description file to this new group. By doing so, the project librarian can create projects and assign users to them, without needing your assistance; the project home directories should—of course—be sub-directories of the directory created by you. Projects managed by one project librarian are protected from those by other project librarians by the UNIX group protection. Projects within a group are not protected against each other, except maybe by making file write-only for the owner.

6.3 EuroSim repository

When defining a project, one can set the project's repository, i.e. the directory where versioned files will be stored.
When using Cadese for version control, the default project repository is a sub-directory called RCS located in the project directory. People working on the same project share a single repository. By placing the repository in a higher level directory, multiple projects may share the same repository. This possibility comes in handy, if people want to have their own working space. Then they simply define their own projects (using a local project definition file), but set their repository variable to the same, shared repository.
When using CVS for version control, the project repository can be chosen arbitrarily.

[1]Please consult one of the many books on UNIX or WINDOWS system administration.

Chapter 7

System Problems

When experiencing problems with EuroSim, there are a number of places you can look for hints as to how to solve them.

1. When something goes wrong, EuroSim often provides feedback directly on the GUI or on `stdout` or `stderr`. Especially important to check are the command logs in the Model Editor (when generating a simulator) and in the Simulation Controller (when running a simulation).
2. When the EuroSim daemon[1] `esimd` has been started with the `-v` flag, a EuroSim simulator will output diagnostic information in the daemon's log file[2] (specified with the `-l` flag) or on the system's console.
3. When started with the `-v` flag, the EuroSim daemon will output information on what it has been doing to the syslog. Check the syslog and search for 'esimd' to find that information.
4. EuroSim is delivered with a so-called 'FAQ'; this is a list of frequently asked questions (and answers!). You can browse this list, which is in HTML format on the CD-ROM, with a standard browser.

When the problem persists, you can contact the EuroSim help desk:

EuroSim Help Desk
Dutch Space BV
PO Box 32070
2303 DB Leiden
The Netherlands
Tel: +31 71 5245 550
Fax: +31 71 5245 498
e-mail: `esim-support@dutchspace.nl`

In all communications, please provide your EuroSim version and license number.
To help you in reporting problems experienced with EuroSim, EuroSim is provided with a tool that allows you to fill in a detailed Software Problem Report and send it to Dutch Space BV via e-mail. You can start this tool, by typing `spr` on the command line, provided `$EFOROOT` and `$PATH` are set as required for normal EuroSim operation. More information on the EuroSim SPR system can be found in Appendix B.

[1]Implemented as a service on Windows NT platforms.
[2]Use the event viewer in the adminstrative tools group on Windows NT platforms.

Appendix A

Source Code Listings

C source of `ansi.c`

```
/*
 * File: ansi.c
 *
 * Contents:
 *
 * $Id: ansi.c,v 2.1 1997/08/18 14:39:55 brandt Exp $
 */
#include <esim.h>
#include <math.h>

static double c_y=0;
static double c_freq=1.5; /* rad/sec */
static double c_ampl=3.14;

void ansi_c(void) {
      double t = esimGetSimtime();
      c_y = c_ampl * sin(c_freq*t);
}
```

Fortran source of `fortran.f`

```

CC File:
C
C Contents:
C
C $Id: fortran.f,v 2.0 1997/03/03 14:33:53 alison Exp $
C

      subroutine F77
      implicit none
      include "esim.inc"
      double precision T, Y, AMPL, FREQ
      common /FORTRAN/ T, Y, AMPL, FREQ
      data Y, AMPL, FREQ /10, 3.14, 0.5/
      T = esimgetsimtime()
      Y = AMPL*sin(FREQ*T)
      return
      end

C     block data
C     double Y, AMPL, FREQ
```

```
C     common /FORTRAN/ Y, AMPL, FREQ
C     data Y, AMPL, FREQ /10, 3.14, 0.5/
C     end
```

Ada source of `mada.ads`

```
--
-- File:
--
-- Contents:
--
-- $Id: mada.ads,v 2.0 1997/03/03 14:33:55 alison Exp $
--
--

package MADA is
      procedure ADA95;
      y:    Long_float;
      ampl: Long_float;
      freq: Long_float;
end MADA;
```

Ada source of `mada.adb`

```
--    'Global_State_Variables
--          LONG_FLOAT MADA.ampl:
--                INIT="3.14",
--          LONG_FLOAT MADA.freq:
--                INIT="0.5"
--
--    'Entry_Point MADA.ADA95
--        'Global_Output_Variables
--                      LONG_FLOAT MADA.y:
--                            INIT="0.0"

--
-- File:
--
-- Contents:
--
-- $Id: mada.adb,v 2.1 1997/08/18 14:39:56 brandt Exp $
--
--
with esim; use esim;
-- with math_h; use math_h;

with Ada.Numerics.Long_Elementary_Functions;
use Ada.Numerics.Long_Elementary_Functions;



package body MADA is

      procedure ADA95 is
            t: Long_float;
            begin
                  t := esimgetsimtime;
                  y := ampl*sin(freq*t);
      --          y := ampl*t;
      end ADA95;
begin
      freq := 0.5;
      ampl := 3.14;
```

```
end MADA;
```

Appendix B

EuroSim Software Problem Reporting System

A software problem report, or SPR, can be submitted via `spr`[1], a GUI tool provided with each EuroSim installation or via WWW,

`URL=http://www-eurosim.dutchspace.nl/EuroSim`

The SPR comes in as an e-mail message to `esim-spr@dutchspace.nl`. Incoming SPRs get an unique identification number and are then stored in a central database, having the status of *unreviewed.* The SPR submitter is notified of the SPR number automatically via e-mail. With this number, he or she can track the status of this and all other SPRs, via WWW, using the same URL as mentioned above.
At regular intervals, the EuroSim software review board (SWRB) convenes, and categorizes the new SPRs in one of the following categories:

Approved for implementation
It is agreed that the software and/or the documentation has to be modified. The SWRB then also indicates which of the EuroSim configuration items are affected, and in which upcoming EuroSim release the modification is planned to be included.

Action Further investigation is required to be able to reach a decision on the SPR.

Pending
The SPR is waiting for further occurrences of the same problem, as it is unclear whether it is a EuroSim problem or not (e.g. user error) *or* it is a minor point and currently no resources are available to evaluate alternatives.

Covered by
The same problem has been submitted earlier, so this SPR is covered by that earlier SPR *or* it is a problem that will be fixed in an already planned new release.

Nice to have
The suggested EuroSim modification is considered by the SWRB as very desirable, but cannot be implemented due to prevailing resource constraints.

Rejected
The SPR is rejected and EuroSim will not be modified.

Where appropriate, the SWRB will include with the SPR an explanation of the SWRB decision, that can again be examined via WWW.

[1]Not part of the installation for Windows NT.

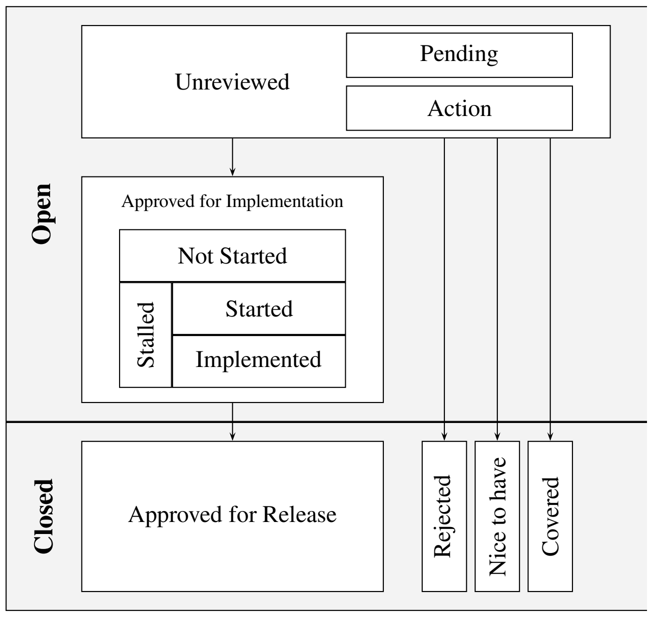


Figure B.1: SPR State Transition Diagram

When an SPR is approved, software modification can commence. The software engineer can change the software modification status from *Not started* to *Started*. When the modification is complete and tested, he or she changes the status to *Implemented*, and provides a Software modification report. The modified files and version numbers are automatically listed with the SPR, provided the SPR number is given when checking in the modifications. If unforeseen problems arise during implementation of the SPR, the modification status can be set to *Stalled*. The SPR will than be re-evaluated in the next SWRB meeting.
The last stage in the life cycle of an SPR is that the SWRB checks that the SPR is correctly implemented. When all is OK, the SWRB decision is changed to *Approved for release*. The overall status of the SPR changes then automatically from *Open* to *Closed*, as no further work on it is required. The submitter will receive the SPR fix either through a patch (for urgent SPRs) or as part of a regular maintenance release of the EuroSim software.

SPR classification

An SPR has both a classification from a user as from a project perspective. The *User Criticality* can be one of:

Critical Being a major problem that hinders the completion of the user's job. This category includes a time aspect, solution is needed as soon as possible, for the user to be able to finish his job.

Major A serious problem has been encountered, but user can still continue with his work.

Minor A problem was noted, but it is not seriously affecting the use of EuroSim.

Suggestion
This category can be used to collect suggestions on how to improve EuroSim.

Question
To be used for questions on EuroSim details.

The *Project criticality* can be one of:

Urgent Fix this SPR as soon as possible.

Normal Fix this SPR for the indicated release.

Maintenance

Fix this SPR as part of regular maintenance.

Appendix C

EuroSim RTI: HLA extension

This appendix describes the additional installation requirements for the EsimRTI: the HLA extension of EuroSim.

Software to install

To use the EsimRTI the following software must be installed:

- IRIX 6.5 as OS.
- EuroSim (with EsimRTI extension).
- DMSO RTI 1.3v6
- the OS patches required by the RTI.
- A CC (C++) compiler to allow the EsimRTI and RTI to be linked (e.g. MIPSpro C++ version 7.30).

More information can be found on the DMSO homepage: `http://www.dmso.mil`.

Environment variables

The following environment variables are required to use the RTI:

Environment Variable	**Description**
`RTI_HOME`	Should point to the RTI-installation directory.
`RTI_CONFIG`	Should point to the config directory in `RTI_HOME`.
`RTI_SAVE_PATH`	Should point to a save directory in `RTI_HOME`.
`RTI_MESSAGE_VERSION`	Should be set to some valid value (e.g. 1).
`LD_LIBRARYN32_PATH`	Should be extended with: `$RTI_HOME/lang/C++/lib/IRIX-6.5-n32`

Bibliography

[SRN05] *EuroSim Mk4.0 software release notes*, 2005, FSS-EFO-SRN-388. Stored in `$EFOROOT/etc/SoftwareReleaseNote`. Final word from developers before packaging; always contains last and latest information concerning delivered EuroSim release.

[SUM05] Dutch Space BV, *EuroSim Mk4.0 software user's manual*, 2005, NLR-EFO-SUM-002. Stored in `$EFOROOT/doc/pdf/SUM.pdf`. This file contains the EuroSim Software User Manual in Adobe Acrobat format. Also stored in directory `$EFOROOT/doc/html/SUM`. This directory contains the EuroSim Software User Manual in HTML format.